

Remarks

Claims 1, 4-14 and 16-34 are pending, with only Claim 1 being independent.

Applicants acknowledge with thanks the withdrawal of the objection to the amendment filed February, 20, 2002 under 35 U.S.C § 132, the withdrawal of the rejection of Claim 20 under 35 U.S.C § 101 and the indication that the claim for benefit under 35 U.S.C § 120 has been complied with.

Among other claim amendments discussed below, Claims 6, 7, 9 and 11 have been amended to introduce proper Markush language and to change the term "may" to -- is -- or -- are --, as appropriate, Claim 20 to provide proper antecedent basis and Claims 19, 21 and 27-29 have been amended to correct typographical errors and remove multiple dependencies.

**Applicants' Response
to the 35 U.S.C § 112 Rejections**

Claims 24 and 25 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly lacking enablement and Claims 5, 6, 7, 9, 11, 12, 16, 23, 26 and 30 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being

indefinite for the reasons are set forth at pages 4-6 of the Action. Applicants respectfully traverse these rejections.

In Claim 5, the Action states that no antecedent basis exists for the term "monomer" in Claim 1, from which Claim 5 depends. Applicants have amended both Claims 4 and 5 to introduce the prefix "2-" to the term "monomer". Thus, reconsideration and withdrawal of the Section 112 rejection of Claim 5 is appropriate.

Applicants have amended Claims 6, 7, 9 and 11 to delete the term "may", as noted above.

Applicants have amended Claim 12 to delete the term "derivatives", as it is clear that referring to ferrocenes (and for that matter titanocenes) as the plural connotes contemplation of that claim embracing chemicals beyond ferrocene (or titanocenes) in the singular.

Applicants have amended Claim 30 to make it depend from Claim 19 rather than Claim 26.

Applicants have removed the brackets appearing in the former amendments to Claim 16; thus, Claim 16 reads as it did as filed.

Accordingly, the Section 112, second paragraph, rejections should no longer be maintained, and reconsideration and withdrawal thereof are respectfully requested.

**Applicants' Response
to the 35 U.S.C § 101 Rejections**

Claim 26 stands rejected under 35 U.S.C. § 101 as allegedly being an improper process claim. Applicants' amendments to the claim overcomes this rejection, and thus reconsideration and withdrawal thereof are respectfully requested.

**Applicants' Response
to the 35 U.S.C § 102/103 Rejections**

The Office Action has continued to reject Claims 1, 4-7, 11-14, 16-22, 26-34 and 36 under 35 U.S.C. § 103(a) as being allegedly obvious over the '180 patent or the EP '721 publication (pages 6-9), and under Section 103(a) as being allegedly obvious over the EP '721 publication, in view of the '944 patent and further in view of the '432 patent (pages 9-10). The Office Action further continues to reject Claims 23-26 and 30-32 under Section 103(a) as being allegedly obvious over the '180 patent or the EP '721 publication, in view of the '944 patent and further in view of Coover (page 10).

Applicants traverse these rejections.

The invention as claimed is directed to broadly a composition comprising: a 2-cyanoacrylate monomer; a metallocene component; a photoinitiator component other than

the metallocene component; and a sulfur-containing compound. The cyanoacrylate is of the formula $H_2C=C(CN)-COOR$, where R is one of C_{1-15} alkyl, alkoxyalkyl, cycloalkyl, alkenyl, aralkyl, aryl, allyl and haloalkyl groups. The photoinitiator is present in a polymerisingly effective amount to render the composition capable of photocuring in air upon exposure to at least one type of electromagnetic radiation selected from ultraviolet light, visible light, electron beam, x-ray and infrared radiation. And the sulfur-containing compound is one or more of sulfonates, sulfinites, sulfates, and sulfites.

The Action cites a number of different documents against the pending claims, the primary ones being the U.S. `180 patent or the EP `721 patent publication (referred together as Mikune).

Mikune is directed to the use of a photocurable cyanoacrylate composition, which includes a cyanoacrylate in combination with a metallocene based on a group VIII metal and a cleavage type photoinitiator.

While Mikune makes passing reference to the addition of specific additives, including as the Examiner points out heat stabilizers at page 10, line 59 thereof, nowhere in Mikuni is it disclosed, taught or suggested that the sulfur containing compounds that Applicants have recited in Claim 1, could be used, or would be desirable for use,

therein, let alone that inclusion of such sulfur containing compounds could improve the physical properties thereof. Dr. Attarwala, in the accompanying Declaration, makes this point clear in paragraph 17 thereof.

Attarwala is used as secondary reference in the obviousness formula developed in the Action.

Attarwala is directed to cyanoacrylate monomer adhesive formulations that include sulfur containing compounds to improve the thermal resistance of the cured adhesive formulation.

Attarwala does not expressly disclose, teach or suggest:

-- the ability of the thermally resistant cyanoacrylate adhesive formulations to be curable by exposure to radiation in the electromagnetic spectrum;

-- the addition of a metallocene component; or

-- the addition of a photoinitiator other than the metallocene, or

that it would be desirable for Attarwala's thermally resistant cyanoacrylate compositions to be photocurable, to include a metallocene (for any reason), or to include a photoinitiator.

Moreover, Attarwala does not expressly disclose, teach or suggest that the addition of a sulfur containing

compound would lead to an improvement in shelf life stability in a photocurable cyanoacrylate composition by the addition of sulfur containing compounds and thus there would be no reasonable expectation of achieving success in reaching that improvement. (Attarwala Declaration, Par. 13.)

In order to render obvious the invention as presently claimed based on the cited documents of record, the Action must provide in properly combinable documents:

A composition with

- a cyanoacrylate
- a metallocene
- a photoinitiator
- one or more sulfur-containing compounds

selected from sulfonates, sulfinites, sulfates, and sulfites.

Simply put, while Mikune discloses the first three components and refers generally to heat stabilizers and Attarwala discloses the first and fourth component, there is no disclosure, teaching or suggestion to combine the teachings of the two documents at the time the invention was made.

Claim rejections cannot be predicated on the mere identification in the documents of record of individual components of the recitations in the claimed combination; rather, particular findings must be made as to why the

patentability is measured under Section 103. And in view of the sensitivity toward fast reaction of cyanoacrylates (noted for instance in the Specification in the Background of the Invention), and the unpredictability of cyanoacrylates in terms of establishing shelf life stability on the one hand and fast reactivity on the other (Attarwala Declaration, Par. 9), it would not have been obvious to provide a sulfur containing compound to a cyanoacrylate that already had a metallocene/photoinitiator package to permit photocuring. (Attarwala Declaration, Par. 17.)

Alternatively, one of ordinary skill in the art would not have thought to combine the teachings of the cited references at the time the invention was made unless given reason to do so, such as by reference to the present Specification which provides that guidance. However, that approach would require impermissible hindsight.

Thus, Applicants respectfully submit that one could only have drawn the conclusion that the combination of Mikune and Attarwala, assuming only for the sake of argument that such combination is proper, renders the claims obvious based on a hindsight reconstruction of the invention as claimed, using Applicants' Specification itself as a tool to weave together the obviousness conclusion.

Moreover, as noted above, Applicants have studied

and report through Dr. Attarwala's Declaration, the affect of the addition of ethylene sulfite (one of the expressly recited sulfur containing compounds) on ethyl-2-cyanoacrylate and on a photocurable cyanoacrylate composition comprising ethyl-2-cyanoacrylate in combination with ferrocene as a metallocene and "IRGACURE" 819 [bis(2,4,6-trimethyl benzoyl) phenyl phosphine oxide] as a photoinitiator and determined that the addition of ethylene sulfite to the photocurable cyanoacrylate composition improved the shelf life stability significantly (measured as a function of the increase of viscosity at room temperature over time). (Attarwala Declaration, Par. 18.)

More specifically, Dr. Attarwala reports in his Declaration that experiments have been conducted in which formulations of 10% PMMA-thickened ethyl-2-cyanoacrylate (Sample A), 10% PMMA-thickened ethyl-2-cyanoacrylate together with 0.005% ferrocene and 0.25% "IRGACURE" 819 (Sample B), and 10% PMMA-thickened ethyl-2-cyanoacrylate together with 0.005% ferrocene and 0.25% "IRGACURE" 819 and 0.05% ethylene sulfite (Sample C) were prepared and evaluated for shelf life stability using an accelerated heat aging technique. (Attarwala Declaration, Par. 19.)

In these experiments, Samples A-C were placed in glass tubes in a temperature-controlled oven at 82°C, and the

number of days to gellation was measured. Sample A was observed to gel to a state of non-flowability after 25 days at that temperature condition; Sample B gelled after 7 days; and Sample C gelled after 10 days. Id.

Thus, while performing not as well as Sample A (without the photoinitiating system or the ethylene sulfite), Sample C (with ethylene sulfite) demonstrated a nearly 43% increase in stability as compared to Sample B (without the ethylene sulfite). (Attarwala Declaration, Par. 20.)

In addition, experiments have been conducted in which formulations of 9.8% PMMA-thickened ethyl-2-cyanoacrylate (Sample D), 9.8% PMMA-thickened ethyl-2-cyanoacrylate together with 0.01% ferrocene and 0.5% "IRGACURE" 819 (Sample E), and 9.8% PMMA-thickened ethyl-2-cyanoacrylate together with 0.01% ferrocene and 0.5% "IRGACURE" 819 and 0.025% ethylene sulfite (Sample F) were prepared and evaluated as above. (Attarwala Declaration, Par. 21.)

Here, Sample D gelled after 18 days at that temperature condition; Sample E gelled after 3 days; and Sample D gelled after 6 days. Id.

Thus, while performing not as well as Sample D (without the photoinitiating system or the ethylene sulfite), Sample F (with ethylene sulfite) demonstrated a 50% increase

skilled artisan, with no knowledge of the claimed invention, would have selected the specific components for combination in the manner claimed. In re Kotzab, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000).

Even if some disclosure, teaching or suggestion was present, which Applicants dispute, there would be no reasonable expectation of success from the cited documents of record in reaching the inventive combination as presently claimed.

The inventive photocurable cyanoacrylate composition is a sensitive system, even more so than a conventional cyanoacrylate composition, in that the addition of agents to perform certain functions may have adverse effects on the stability, for instance, which may be dramatic. (Attarwala Declaration, Par. 9.) Thus, one would not have looked to add to a cyanoacrylate, first a combination of the metallocene/photoinitiator package to render the composition photocurable and next a sulfur containing compound, absent some express suggestion to do so.

Rather, given Mikune and looking at Attarwala, at most it may have seemed "obvious to try" to include one or more certain sulfur containing compounds to confer thermal resistance properties to a photocured cyanoacrylate composition; however, that is not the standard by which

in stability as compared to Sample E (without the ethylene sulfite). (Attarwala Declaration, Par. 22.)

Accordingly, while Applicants do not concede that a case of *prima facie* obviousness has been established in the Office Action, the information provided above by Dr. Attarwala in his Declaration sufficiently rebuts any such case, in any event.

The Action also uses Gatechair as a tertiary reference in combination with Mikune and Attarwala.

Gatechair, as described in the Specification, speaks to a free radical polymerizable composition which includes (a) polymerizable partial esters of epoxy resins and acrylic and/or methacrylic, and partial esters of polyols and acrylic acid and/or methacrylic acid, and (b) a photoinitiator blend of a cyclopentadienyl iron complex and a sensitizer or photoinitiator, such as an acetophenone.

Gatechair adds nothing to the obviousness formula advanced in the Action.

While one of the chemicals to which Gatechair refers is in part an acrylate, cyanoacrylates which are used in the inventive compositions herein, have quite disparate properties and have developed as separate class of chemicals, particularly in the adhesives industry. Thus, the acrylate- and epoxy-containing compositions of Gatechair are not the

cyanoacrylates used by Applicants. (Attarwala Declaration, Par. 15.) Therefore, whether Gatechair's photoinitiator is substitutable for the photoinitiator disclosed in Mikune is irrelevant. Also, for the sake of discussion, while motivation to combine the disclosure of these patent documents may exist in the context of acrylate chemistry, such motivation does not exist in the context of cyanoacrylate chemistry, as neither Mikune nor Gatechair indicates that the chemistries are interchangeable. Accordingly, no suggestion or motivation exists to combine Gatechair with Mikune or Attarwala.

Lastly, Coover is used as a tertiary reference against Claims 23-25 and 30-32. Coover, also as described in the Specification, relates to cyanoacrylates generally, in which they are described as quick-setting materials which cure to clear, hard glassy resins, useful as sealants, coatings, and particularly adhesives for bonding together a variety of substrates.

Coover does not teach or suggest the ability of curing cyanoacrylates through exposure to radiation in the electromagnetic spectrum, let alone the addition of a particular sulfur containing compound to achieve any desired effect. (Attarwala Declaration, Par. 16.)

Double Patenting

Obviousness Type Double Patenting

Claims 1, 4-14 and 16-36 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over:

-- Claims 1-9, 11-14 and 16-34 of co-pending U.S. Patent Application No. 10/094,816 in view of Attarwala for the reasons given at pages 11 of the Action;

-- Claims 1-20 of U.S. Patent No. 5,922,783 in view of Attarwala for the reasons given at pages 11 and 12 of the Action;

-- Claims 1-20 of U.S. Patent No. 5,922,783 in view of Attarwala, and further in view of Mikune for the reasons given at pages 11 and 12 of the Action; and

Claims 26-26 and 30-32 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over Claims 1-20 of U.S. Patent No. 5,922,783 in view of Attarwala, and further in view of Coover for the reasons given in the paragraph bridging pages 12 and 13 of the Action.

Applicants traverse each of these double patenting rejections.

Nevertheless, in view of Applicants desire to advance prosecution on the merits but without conceding the propriety of the bases for these double patenting rejections, Applicants are prepared to submit a Terminal Disclaimer to remove co-pending U.S. Patent Application No. 10/094,816 and the '783 patent from the rejections set forth above.

Accordingly, upon submission of such terminal disclaimer the obviousness type double patenting rejections should no longer be maintained and withdrawal thereof is respectfully requested. Applicants respectfully request express acknowledgement by the Examiner in the next written communication that such submission would remove the obviousness type double patenting rejections.

Conclusion

Based on the above, therefore, Applicants respectfully submit that each rejection has been addressed and overcome.

As such, favorable reconsideration and passage to issue of the subject application are respectfully requested.

Applicants' undersigned attorney may be reached by telephone at (860) 571-5001, by facsimile at (860) 571-5028, or by email at steve.bauman@loctite.com. All correspondence should continue to be directed to the address given below.

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